

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



aS622.S6

January

1985

Volume 5, Number 10

# Soil and Water Conservation News

LIBRARY

260-5

File Code

R-629-0

United States Department of Agriculture  
Soil Conservation Service



Water Conservation News is the official publication of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget through January 31, 1987. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Postage paid at Washington, D.C.

**Magazine inquiries**  
Send inquiries to: Editor, *Soil and Water Conservation News*, Public Information Staff, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, D.C. 20013-2890.

**Subscriptions**  
Send subscription orders to: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

## Comments:

### From the SCS Chief

## USDA Agencies Cooperate to Improve RC&D Program

A U.S. Department of Agriculture interagency group is working to make the Resource Conservation and Development (RC&D) Program the most effective, efficient program it can be.

A policy board and a work group, chaired by Richard D. Siegel, Deputy Assistant Secretary for Natural Resources and Environment, are helping to chart the future course for the program. Other members include the Deputy Under Secretary for Small Community and Rural Development and representatives of the Agricultural Stabilization and Conservation Service, Extension Service, Forest Service, Farmers Home Administration, Soil Conservation Service, and the Office of Rural Development Policy.

A USDA task force study of the RC&D Program in 1978 suggested establishing the policy board. Later, the Congress incorporated the policy board provision in the RC&D subtitle of the 1981 Farm Bill. SCS wholeheartedly endorses this approach to making the RC&D Program more effective in meeting the Department's objectives for resource conservation and development in rural America.

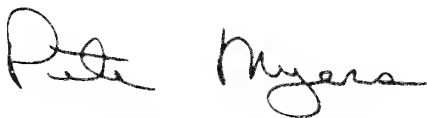
The RC&D effort calls for strong interagency coordination. At the State and county levels, USDA officials are already successfully working together on "rural development committees."

Two examples come to mind, one in Wisconsin and one in New York. In northern Wisconsin, the first Forest Service RC&D coordinator—in cooperation with SCS, other USDA agencies, and local leaders—is creating a market for the area's vast timber resources. The effort has led to improved woodland management and more jobs in this area of high unemployment.

In New York, a USDA cooperative effort through RC&D is convincing cash grain farmers that raising livestock is an economically sound alternative. As a result, farmers are converting their highly erodible cropland to pastureland.

Resource conservation and development is complex. It affects the environment, it affects the economics of an area, and, most importantly, it affects people's well-being. Rural America deserves all of the expertise that USDA working together can bring to helping solve its problems.

There is strong and persistent local support for the RC&D Program and its accomplishments. The RC&D policy board knows this and will be looking for the best ways for USDA to continue to help rural America as it changes and grows.



**Cover:** Sheep graze reclaimed mine land in Clearfield County, PA. See articles on land reclamation beginning on page 8. (Photo by Frederick E. Bubbs, public affairs specialist, SCS, Harrisburg, PA.)



John R. Block  
Secretary of Agriculture

Peter C. Myers, Chief  
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, creed, color, sex, age, or national origin.

Editor, Judith E. Ladd

Associate Editor, Paul D. Barker

Associate Editor, Nancy M. Garlitz

Editorial Assistant, Ann P. Serota

Design Consultant, Christopher Lozos

Reprint permission

Contents of this magazine may be reprinted without special permission. Mention of source is requested. Photos available on request.

Commercial names

Mention of commercial enterprises or brand names does not constitute endorsement or imply preference by the U.S. Department of Agriculture.

## Automated Flood Warning Reduces Flood Damages

"It's up to the ceiling; everything I have is under water," said a victim of recent flooding in Connecticut. "I didn't have enough time to save anything."

This is a common lament in Connecticut where nearly all of its 169 communities suffer annual flood losses totaling \$50 million. Statewide, 40,000 buildings are in flood zones, and every community in the State has flood-prone lands.

To explore ways of helping citizens reduce property losses and protect lives, the Soil Conservation Service and the Connecticut Department of Environmental Protection (DEP) met with the National Weather Service (NWS) in the summer of 1983.

For communities along larger rivers like the Connecticut and Housatonic that can take days to peak during flooding, current

warning procedures are usually adequate. But in watersheds with drainage areas of 15 to 200 square miles, where flooding can peak in 4 to 8 hours, citizens need almost instantaneous warning.

To make fast, accurate flood predictions in these areas of flash flooding, the NWS has developed an automated flood warning system that uses microcomputers and simple data collection systems. The automated flood warning system is being used in parts of California, Arizona, New York, Rhode Island, and nine other States and in several other nations.

Known as ALERT (Automated Local Evaluation in Real Time), the system will be used in two Connecticut communities this spring as part of a pilot project. SCS, DEP, and five other State and Federal agencies represented on the Committee on Automated Flood Warning will be studying the pilot systems as they plan the Nation's first statewide system, ASERT (Automated Statewide Evaluation in Real Time).

"We were looking for nonstructural solutions to reducing flood damages," said Philip H. Christensen, SCS State conservationist in Storrs. "What we needed was an effective flood warning program that included flood preparedness training for property owners. ALERT provides the foundation for such a program."

The major components of the automated flood warning system include precipitation gauges, river gauges, radio transmitters, radio receivers, and a microcomputer. Radio messages from monitoring equipment instantly transmit precipitation and river levels to the NWS Northeast River Forecast Center in Bloomfield, CT. The data are processed at the center and then relayed to local flood warning stations.

Local flood warning stations are equipped with a microcomputer single crystal analog receiver, decoder, telephone modem, uninterruptable power supply, and a remote terminal for a local coordinator. For the pilot project in the city of Norwich and town of Southington, the microcomputers will be set up in the police department headquarters because

This automated precipitation gauge above Hartford, CT, sends a radio signal to the National Weather Service River Forecast Center in Bloomfield every time a millimeter (0.04 inch) of rain or snow tips a tiny measuring bucket at the top of the gauge. The gauge has been used to show State and local leaders how an automated flood warning system operates. It will become part of a statewide warning system.

Photo, Phil Morneault,  
public affairs specialist,  
SCS, Storrs, CT.



they are staffed around the clock.

When the statewide system is in place, the same data that go to the River Forecast Center will also go to DEP for use in dam safety monitoring, forest fire prevention, and long-term data collection.

At the automated precipitation gauges, each millimeter (0.04 inch) of rain, or its equivalent in snow, tips a tiny measuring bucket which initiates a radio transmission. In less than one-fourth second, a radio message made up of the precipitation report and a gauge location identifier travels to the River Forecast Center. The number of gauges needed depends upon basin shape and topography. For example, the Yantic River watershed, which the Norwich pilot project will monitor, has a drainage area of 96 square miles and requires five precipitation gauges.

All of the radio transmitters for an ALERT or ASERT system operate in a frequency band reserved by the Federal Communications Commission for the transmission of weather-related data. At these frequencies, radio transmission is line-of-sight. In other words, if an observer at a transmission site can see the receiver site, a radio signal can get through. Occasionally, however, hills or buildings block the desired path and a radio repeater is used to get the signal through.

Radio repeaters receive signals from precipitation and river gauges and immediately rebroadcast the signals to the River Forecast Center. Radio repeaters are generally located at the highest elevations in the area, which provide a good view for both transmission and reception. For a statewide system in Connecticut, about 20 automated precipitation gauges and six repeaters are needed to develop an automated precipitation data base.

The main weather data receiver at the River Forecast Center monitors incoming data, translates the radio signals into a series of computer compatible "discrete" pulses, and stores the information for use in forecasting programs.

Local microcomputers also continuously monitor the precipitation and river data. When monitoring reports from the gauges in the watersheds and from

surrounding areas exceed critical values, the microcomputer sounds an alarm. The alarm insures that the person attending the local station is immediately made aware of the growing flood threat. That is why it is essential for the equipment to be located in a facility that is staffed 24 hours a day.

The microcomputer can simultaneously coordinate numerous data reports, answer user questions, and communicate with remote computers. The speed and accuracy of the computer make it possible to issue effective early flood warnings.

Through computers the River Forecast Center can also prepare and send forecast advisories and other flood guidance information for use by local officials. A telephone interface will enable local officials to obtain data from the statewide ASERT system.

"In the past, we could only put out very general forecasts on flooding," said Todd Mendell, an NWS flash flood hydrologist at the River Forecast Center. "Volunteers would call in information on the amount of rain that had fallen and on other weather conditions. But these observers had to be at the right place at the right time to make the reporting meaningful. Volunteers go on vacation, out to dinner, and to the movies. It was obvious that we needed an automated system."

"It's only been in the last 5 to 10 years that progress in electronics has made the development of the ALERT/ASERT system possible. The ALERT system enables us to provide some degree of protection to those communities that haven't received it before. They can receive data on their own and act on their own. We have real time data for the first time on smaller streams."

The SCS and DEP will purchase and install rain and stream gauges for the two pilot flood warning systems in Southington in the Quinnipiac River watershed and in Norwich in the Yantic River watershed.

The communities are responsible for purchasing the computer equipment to receive the monitoring information, preparing an emergency action plan,

assisting with landrights acquisition for the gauges, and providing information to residents and business people in flood-prone areas. The two pilot systems are scheduled to be in operation this summer.

The NWS has invested \$5 million nationally in the development of automated flood warning systems and estimates it will be contributing \$400,000 to meeting Connecticut's flood warning needs.

SCS is providing \$160,000 for the purchase of automatic precipitation and river level gauges for the pilot communities and providing individual flood damage reduction assistance as well as overall project coordination. Said Christensen, "The pilot project qualifies for funding as a special project under the Soil and Water Resources Conservation Act. This project also meets one of the agency's highest priorities under the National Conservation Program, reducing upstream flood damages."

"Giving residents in small watersheds more advance warning of flooding is the first step in helping them reduce flood damages," said Christensen. "But by itself, it won't help them reduce the damages they suffer. They must know what to do to protect their property."

"Removing a furnace motor, shutting off electrical connections, putting large plastic bags under washing machines or dryers and pulling them up over the appliances during flooding, and moving automobiles and other property to higher ground can make a big difference in the cost of a flood to an individual. That's why SCS has contracted with the Connecticut Council on Soil and Water Conservation to make individual flood audits for residential and commercial property owners."

Tom Mocko, project director for the Council, will be directing the flood audit effort in Norwich and Southington. "Once flood zones have been delineated by the U.S. Army Corps of Engineers and U.S. Geological Survey, we will identify the buildings that will be affected by flooding," said Mocko. "We'll make appointments with property owners to explain the flood warning system to them and how



inundation maps show that their property would be affected by different stages of flooding.

"On the first visit we'll make an inventory of what could be damaged at each of three levels of flooding. For example, when the river reaches 8, 10, or 12 feet, we can tell property owners what they could expect to be damaged at those different flood stages.

"We'll be looking at the structure of the basement and the location of openings and foundation drains. We'll use this information to predict the hydraulic effects of floodproofing because sometimes it can cause more structural damage than moving contents up out of the flood zone and letting the water come in. On the second visit, we will give property owners a checklist of things they can do to protect the contents of their home or business," said Mocko.

"Factories and other industries will be encouraged to hire structural engineers to assure that any floodproofing they would do would not cause structural damage to the building."

The flood audits are scheduled to be completed for the pilot communities by September 1985. Two people will be working in each area. The project will involve making almost 200 flood audits.

Mario Tristany, city planner for Norwich, said, "This coordinated flood warning effort throughout the watershed will provide more advance warning of flooding. This will give people whose property is susceptible to inundation more time to move their possessions up or out of the flood zone. Now, about 5 percent of the city's population suffers more than \$1 million worth of flood damages every year."

"The State of Connecticut, in cooperation with SCS, the U.S. Army Corps of Engineers, and others, has made significant progress in reducing flood damages through structural programs and made good progress in reducing additional development in flood plains," said Christensen. "Yet, flood damages in the State continue to total more than \$50 million annually.

"The use of an early flood warning

system can reduce flood damages by 3 to 15 percent, according to U.S. Army Corps of Engineers estimates. Assuming a system would reduce damages by 10 percent in 50 percent of the flood hazard areas, in Connecticut, for example, a flood warning system tied with property protection could have reduced flood damages in the State from the June 1982 storm that caused \$300 million worth of damage by \$15 million."

When the statewide system is fully developed, up to 35 percent of residential flood damages could be saved, with commercial and industrial savings going even higher. The Committee on Automated Flood Warning estimates that the installation, operation, and maintenance of a complete ASERT (statewide) system will cost approximately \$2 million over a 10-year period.

Phil Renn, SCS water resources coordinator in Storrs, said, "The benefit/cost ratio of a statewide flood warning system could be 20 to 1 even with yearly maintenance costs included."

"The goal of SCS and the other cooperating agencies is to develop in Connecticut the Nation's first statewide automated flood warning system," said Christensen.

"A statewide flood warning network which includes property protection measures is the single most cost-effective way to reduce the flood damages that Connecticut residents suffer every year. We plan to have the system in full operation by the early 1990's."

**Nancy M. Garlitz,**  
associate editor, *Soil and Water Conservation News*, SCS, Washington, DC



Phil Renn, SCS water resources coordinator in Connecticut, tests an umbrella-type antenna that will send radio signals from an automated precipitation gauge to the National Weather Service River Forecast Center in Bloomfield. The canister contains a transmitter and battery pack.

Photo, courtesy of  
*Meriden Record/Journal*.

## Earlier Warning Calls for Better Planning

Connecticut has suffered needless loss of life and considerable property damage from recent floods and may suffer similar or greater losses in the future. But every resident, retail operation, and industry cannot be moved out of flood-prone areas, and a flood control project cannot be built to protect every structure. Losses can be reduced, however, using an automated flood warning system developed by the National Weather Service.

Such a system has proven useful and cost effective in other parts of the Nation. When implemented in Connecticut, it will provide hours of additional warning time, will reduce the potential loss of life, and will save from 3 to 15 percent of residential property losses and a greater percentage of commercial and industrial losses.

Flood warnings are now conveyed over public media and teletype services with few municipal officials being directly notified of potential flood problems in their particular drainage areas; likewise, emergency services are not given timely, firsthand information on flood levels.

In part because of the limited warning time under the present systems, few municipalities have adequate flood preparedness plans. The advance warning Connecticut municipalities will be receiving with the new automated flood warning system being installed puts more responsibility on municipal officials to upgrade their emergency plans.

The first concern during a flood is citizens' safety. Plans must be made well in advance for instructing them in safely evacuating their homes and businesses. Alternative routes must be identified and residents must know where they will be able to find medical help and emergency shelter.

A well-organized local staff including public works department, fire fighters, police, and medical and health services must be ready to act. Members of the team and their alternates should rehearse their parts during mock flood emergencies to eliminate duplication of

effort and identify changes needed in the plan.

Local flood warnings are made based on recorded local precipitation data, specific stream gauge information, projections from the statewide precipitation network, and knowledge of the condition and capacity of upstream reservoirs. When it is clear that a damaging flood will occur, and the flood stage is predictable, the warning will be issued and the local early action team can go to work. Organized teams can help the handicapped, elderly, and youth, and can assist prepared residents in carrying out their property protection plans.

A regular program of maintenance is needed to assure that the automated systems will work when needed most. Batteries at remote monitoring stations must be replaced annually; all equipment must be checked, cleaned, and calibrated; and local flood warning stations should be upgraded as needed.

Annually, practice warnings should be conducted to test the equipment and personnel.

Ironically, the ability of people to forget unpleasant situations is the greatest handicap in implementing flood warning programs. People tend to quickly forget the \$1,000 they lost in flood damages, but remember forever every detail about winning \$1,000 in the lottery. This emphasizes the need to develop an adequate continuing education and training program.

---

**Philip H. Christensen,**  
State conservationist, SCS, Storrs, CT

---

## Nonstructural Solutions for Reducing Flood Damage

Reducing flood damages in upstream areas is a top priority for the Soil Conservation Service under the National Conservation Program. Local and State programs of automated flood warning and early action by property owners are a cost-effective way to meet the challenge.

Here are some things SCS can do:

- Consider flood warning as an element in flood prevention projects;
- Assist States in developing State plans for developing a flood warning program;
- Help inform the public of the value of effective flood warning programs;
- Provide technical assistance to local officials and property owners in developing damage reduction plans; and
- Provide flood inundation maps, flood elevations, and assistance in flood plain management.

---

## Brochure Available on Natural Disaster Assistance

The U.S. Department of Agriculture (USDA) has issued a brochure entitled "Natural Disaster Assistance Available From the U.S. Department of Agriculture." It lists the 10 agencies which provide disaster assistance, the types of assistance, and where to apply for assistance. For example, the entry for the Soil Conservation Service says that SCS "provides technical and financial assistance for runoff retardation and soil erosion prevention as needed to reduce hazards to life and property from floods, drought, and the products of erosion on any watershed impaired by a natural disaster." It further explains how SCS can help and what information and materials are available.

The brochure (Program Aid Number 1328) is available from local USDA offices.

---



## Researchers and Officials Exchange Information on Natural Hazards

The Natural Hazards Research and Applications Information Center is a national clearinghouse for research data dealing with the economic loss, human suffering, and social disruption caused by earthquakes, floods, hurricanes, and other natural disasters. The information center is at the University of Colorado in Boulder.

Through the information center, researchers learn what other researchers are doing, and Federal, State, and local officials responsible for guiding public action before and after natural disasters benefit from the results.

The information center has been operating for 8 years and is supported by seven Federal agencies: the Federal Emergency Management Agency, the National Science Foundation, the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, the U.S. Army Corps of Engineers, the National Institute of Mental Health, and the Tennessee Valley Authority.

The information center sponsors an annual invitational workshop on natural hazards research. About 200 representatives of Federal, State, and local governments; private industry; public interest groups; and research institutions meet at the workshop to discuss a wide range of problems and needs in the natural hazards field.

Issues considered at past workshops have included: earthquake hazard reduction programs; mental health and disaster; flood plain land use; hurricane perception related to response; natural hazards warning systems; and local government liability.

The information center publishes a free bimonthly newsletter, the *Natural Hazards Observer*, which reports on new research and findings from completed projects; pertinent legislation; applications of research at Federal, State, and local levels, and by private agencies; and announcements of recent publications and future conferences.

The newsletter goes to members of government agencies; local planning and public works departments; researchers; planning consultants; members of the business, insurance, and financial communities; editors of professional journals; and libraries. Foreign subscriptions cost \$15 per year.

Staff members at the information center answer requests from individuals and organizations for information and recommend other sources of information. They also maintain an extensive collection of hazards literature. The collection includes approximately 8,000 reports, reprints of professional papers, brochures, books, statutes, and administrative regulations.

The information center publishes the monograph series of the Program on Environment and Behavior at the University of Colorado. The series presents research findings and critical reviews of research needs in social response to extreme environmental events.

Monographs have been published on earthquake prediction and public policy, modeling systems for disaster policy analysis, intergovernmental management of hazards, and natural hazards data resources. The monograph series may be purchased on a subscription basis.

For more information write to: Natural Hazards Research and Applications Information Center, Institute of Behavioral Science #6, Campus Box 482, University of Colorado, Boulder, CO 80309.

---

## Research Agenda for Floods

A recent report issued by the Illinois State Water Survey describes 115 priority tasks for future research on flood hazard mitigation. The report is the result of an 18-month assessment of U.S. flood research needs.

Some of the research recommendations outlined in the report are:

- Develop reliable methods for predicting the effect of land use on flood peaks, volume, and sediment production.
- Investigate the sources of large amounts of debris in streams and ways to avoid formation of debris dams.
- Determine the effect of flooding on ground water quality, including bacteriological, virological, and chemical contaminants.
- Carry out an economic evaluation of existing public policies and institutions for flood hazard mitigation.
- Examine the adequacy of integrated warning systems and the procedures for formulating messages and sending them out.
- Pursue a program of long-term comparative studies of flood victims, including specific measures of individual physical and mental health.
- Identify instances of successes and failures of State and local governments to obtain authority and funds for planning and acting on flood mitigation.

A major conclusion of the assessment is that more attention should be given to economic, geographic, sociological, and political science research to reflect the shift in national policy from structural to nonstructural approaches to dealing with flood problems.

Single copies of the report, *A Plan for Research on Floods and Their Mitigation in the United States*, are available at no charge from the Illinois State Water Survey, Box 5050, Station A, Champaign, IL 61820.

---

# Reclaimed Land

## Sheep Graze Reclaimed Mine Land

Sheep farmers are scarce in coal country, but that could change if land users followed the example of Tim and Wayne Kunes.

The Kunes operate a 240-acre farm in northern Clearfield County, PA, where they raise 600 head of sheep and harvest 30 acres of apple orchards.

What is unusual in their operation is the use of mine land for sheep pasture. "It all started about 1972 when we leased a property for coal mining," Wayne said. "After mining we had nothing but rocks. In 1972, replacing topsoil was only beginning to be required so this was typical of mine sites during that time.

"Managing reclaimed mine land is similar to managing nonmined areas used for pasture," Wayne explained. "Tim fences 5- to 15-acre blocks. You've got to be very careful in managing grazing. Overgrazing is very easy to do. We rely on our own judgment and experiences to manage these grass stands."

The Kunes are good examples of farm-

ers who understand the importance of good grazing management. They use all aspects of their feeding program to benefit the soil and the plants. They watch the stands closely to prevent overgrazing. By supplemental feeding in the field throughout the winter, they put a lot of extra seed and manure in the fields without any extra cost. They monitor the need for liming. As you walk over the fields, you see that their program works. Stocking rates are comparable to nonmined areas, especially where they have been grazing sheep for more than 10 years.

"We've seen improved stand density and regrowth every year since mining," Wayne said. "The first year the stand was brown in July. Now, the same area sustains growth all season. It takes time and patience. You could never crop these mined areas because of the surface rocks, so pasture is a logical substitute.

"Good water is rare in extensively mined areas like ours," Wayne continued. "In 1960, the local municipal water authority built a reservoir in a nearby nonmined watershed and a distribution system to serve parts of two townships.

This high-quality water is used in all of our farming operations."

The Kunes are constantly trying new ideas. Although they have been successful with cool season grasses, they are always ready to try new plants such as warm season grasses or brassicas. They also plant row crops using the no-till method to provide creep feed for lambs.

The mined areas today are highly variable in their ability to sustain productive crop use. With more than 100,000 of the 730,000 acres in Clearfield County in mined land, it is a large part of the land resource. Pasturing is an excellent use for this land. While the advice of a conservationist or a county agent is welcome, it takes more than that to make it work. It takes farmers who are dedicated enough to go out there every day and do the work.

If every farmer matched the Kunes' enthusiasm, there would be a lot more fences around mine land.

**Eric Carlson,**  
district conservationist, SCS, Clearfield, PA

Part of the Kunes' flock of sheep graze on reclaimed strip mine land. In the background, active mining continues.





## Mine Spoil Produces on Dairy Farm

Mine spoil is the most productive soil on at least one Pennsylvania farm. It has better tilth, provides higher crop yields, and erodes less than the other soils on Prisk Dairy Farms in Clearfield County.

Prisk Dairy Farms is a family operation located in the Little Clearfield Creek watershed in one of the most heavily coal-mined areas in Pennsylvania. The Prisks use every available acre to produce feed for their 150-head dairy herd. More than 40 percent of the open land within 4 miles of their farm is mined land, and the Prisk brothers—Don, Ken, and George—and their father, Lynn, have been farming some of these mined areas since the mid-1960's, before soil reconstruction was required.

Soil reconstruction is the replacement of the upper layers of soil that are removed for mining. These upper layers usually have the characteristics most favorable for most uses. If the topsoil is not replaced, the mine spoil left on the site is commonly a highly acid material in which few plants can develop productive root systems.

The mine spoil on the Prisk farm is not acid, however, but alkaline. "We have a type of rock we call 'buckwheat' shale that breaks down very fast when exposed," explained Ken. "We've found that this type of shale has developed into a fine-textured soil with good tilth after 20 years of cultivation."

"Buckwheat" shale is actually a highly fissile shale associated with Freeport coals. These coals were formed by freshwater deposits, and the surrounding layers of shale are often calcareous. Water rapidly percolates through the shale, and its alkalinity lets deep-rooted plants such as alfalfa develop an effective network of roots.

The tilth Ken speaks of was evident as he dug his heel into the loose soil in an area that was once mined. "We use liquid manure at a 30-ton-per-acre rate to provide both fertility and organic matter to these shales," Ken said. "Corn production is highly variable. We have seen

yields up to 120 bushels per acre when adequate moisture is available on the land stripped 20 years ago."

"Our nonmined soils are Cavode and Wharton series—very heavy and not well suited for alfalfa," said George. "Our best alfalfa yields consistently come from the mined land. It seems that the alfalfa roots easily find their way down to moisture. We consistently get four cuttings of alfalfa with yields of 6 to 8 tons per year off stripmined land. Before stripping, that same land wouldn't grow alfalfa."

The brothers said that last summer's drought did not affect their alfalfa yields. Corn on the older shale banks, however, produced only short stalks and small ears.

"We see erosion control as another advantage to the shale," said George.

"Every spring, we see small rills in some of our nonmined fields where silage corn was removed. The shale mine soil is much more porous, so there is less runoff of surface water and less erosion."

"We've found that replacing the heavy clay subsoil, as is done on some recently mined areas, creates a high erosion potential and does not provide as productive a soil as these older areas are providing," said Ken. The present law requires that a judgment be made about whether to replace such subsoil layers after mining. If necessary to restore productivity, they must be replaced.

"The clay of the Cavode soils packs almost as hard as concrete," Ken said. "You can't even plow it. We're better off with the shale on top."

**Eric Carlson,**  
district conservationist, SCS, Clearfield, PA

## Ranchers Reclaim Land Mined for Gold

Land once heavily mined for gold has been converted into a ranch in Grass Valley, CA. The North Star Ranch in Nevada County is now a model for range reclamation in the foothills of northern California.

The ranch was started in 1929 when Arthur Foote bought 136 acres from the North Star Mining Company, of which he had been superintendent. The land had supported various gold mining operations for 45 years. Foote's daughter Marian and her husband Ray Conway later took over the ranch and acquired an adjacent dairy farm. The ranch now covers 316 acres and is surrounded by urban development.

The Conways began in 1939 by converting 100 acres to pasture. They removed blackberries, willows, alder, rocks, loose gravel, and mine tailings. They seeded hardinggrass, alfalfa, and burnet. Where it was not possible to prepare a seedbed, they planted perennial ryegrass, burclover, and vetch.

At first, the family kept chickens and a few dairy cattle for their own use. During World War II they raised 12,000 fryers a year and supplied restaurants nearby and in Sacramento. They also sold milk and butter to neighbors and built a bigger house for their growing family.

The Conways sold their fryer business after the war and began raising 10,000 pheasants a year for private hunting clubs. "With fertilizer from chickens and pheasants, we could grow grass on rock," Conway says. "We needed something to eat the grass." They switched to beef cattle in 1971.

Another measure they took to improve the pasture was to break up a restrictive layer in the soil. Conway removed the topsoil from 12 acres, broke up the layer so that roots could penetrate it, and then replaced the topsoil. Economic considerations were secondary to the conservation goal of this project, and Conway is satisfied with the results. "We were able to reclaim land that had been worthless for cattle," he says.



Between 1976 and 1980 the Conways reorganized the ranch's irrigation system. They installed several miles of underground drains and diversion structures and seeded much of the ranch to reduce erosion. In 1979 they built more than 5,000 feet of fencing.

Today the pasture on the ranch could support 100 head of cattle, but the Conways keep a herd about half that size to further protect the pasture. They have also improved the range in other areas of the ranch and have set aside more than 50 acres for wildlife, including quail and pheasants.

The Conways have been cooperators since 1947 with the Nevada County Resource Conservation District. The district named them "Cooperators of the Year" in 1982.

**Marilyn Gibson,**  
area information specialist, SCS, Sacramento, CA

---

## Small Town Makes RAMP Work

A 17-acre abandoned surface mine in central Pennsylvania has been transformed into an outdoor recreation center. Citizens of the small coal mining community of Kulpmont have created a softball field, jogging and exercise track, and playground on land that was little more than a trash dump.

The site was reclaimed with technical and financial assistance from the Soil Conservation Service under the Rural Abandoned Mine Program (RAMP). Local agencies and volunteers provided the recreational facilities.

Much of the land in the area around Kulpmont Borough in Northumberland County shows the scars of coal mining. The abandoned mine site in Kulpmont had become an eyesore and hazard to the residents, especially the children who played there.

In 1979, Kulpmont officials applied for assistance from SCS to reclaim the abandoned site. The SCS staff reviewed the problem and determined the site to be a

danger to public health and safety, making it eligible for funding under RAMP.

At that time there was an unstable 40-foot highwall—a steep, unexcavated face on the hillside—within 300 feet of an elementary school. There was also a 35-foot-deep pit that usually filled with water during spring and took months to dry out. The water that percolated through the soil eventually reached deep mines in the area and contributed to acid water pollution. The water standing in the pit was a breeding ground for mosquitos. After a flood in 1972, the Federal Disaster Assistance Administration provided \$50,000 to pump out the pit.

An SCS civil engineer, Sam Young, designed a plan to reclaim the area by backfilling and installing surface water control measures. A bid from a contractor was then accepted, and by October 1981 more than 107,000 cubic yards of fill material had been placed in the area and seeded at a total cost of \$372,000.

Former Mayor Miriello and the Kulpmont Borough Council envisioned more for this site, however, than the removal of safety hazards. They hoped enough local support would be generated to provide a much-needed recreational facility.

The County Parks and Recreation

Board provided a fence and bleachers for the softball field. Volunteers and a Comprehensive Employment and Training Act crew raked and cleared rocks. A coal company delivered topsoil that was spread for the playing surface. Borough employees, with volunteer assistance from a local contractor, installed the jogging track. The local Lions Club donated playground equipment and picnic tables. Miriello explained later, "The interest of the local people expressed in this project from the beginning was overwhelming. The efforts of all the individuals involved will be appreciated by this community for years to come."

By the summer of 1983, a softball league of eight teams was using the field nearly every day. "As money becomes available," said Councilman Marlin Hodge, "another field could be built, and the possibility of other recreation and athletic facilities is in the minds of some people. Lights will eventually find their way onto the field, but that is in the future. Most importantly, what we have done here is give the people of Kulpmont a place for recreation and an opportunity to be proud of their community."

**Kevin Blake,**  
district conservationist, SCS, Sunbury, PA

---



A softball field and other recreational facilities now occupy the site of a former abandoned surface mine in Kulpmont, PA.

## Landfill Returns to Nature

Citizens of Lawrence, KS, are converting their old landfill into a nature area. With technical assistance provided by the Soil Conservation Service, they are changing a 210-acre disposal site along the Kansas River into an area for wildlife and recreation.

Developing the site is a 10-year-old dream that is becoming a reality for Fred DeVictor, director of the city Parks and Recreation Department. "It goes back to when the city was planning the Kansas River Front Park," DeVictor said. "The landfill was still in operation then, but we knew it was going to be filled someday and we wanted to develop it into a nature area."

SCS assisted in developing a plan to revegetate the landfill and create a wildlife area. The plan divides the landfill, which is next to the park, into three segments. Each segment contains 6 kinds of native grass and 13 species of trees and shrubs for maximum diversity. The trees and shrubs were selected to produce as much "edge" transitional habitat as possible. Diversity and edge are critical for supporting an abundant variety of wildlife.

The three segments are surrounded by borders of tame grass and legumes. These borders serve as firebreaks, access roads, and nature trails.

Much of the project was completed in 1984. Students employed in a summer community development program planted more than 4,100 trees and shrubs and 68 acres of native grass. Twelve acres of border was seeded to cool season grasses and legumes in the fall.

The project has been a cooperative effort of several agencies. The Kansas Fish and Game Commission financed a major portion with a grant through the Nongame Wildlife Tax Checkoff Program. Such grants are made possible in Kansas by individual contributions made through a special line item on the State income tax form.

The plan calls for the planting this spring of another 30 acres of native grass and another 6 acres of tame grass and legumes in the borders. After that the

Jayhawk Audubon Society and a local Boy Scout troop plan to install martin houses, nest boxes, nature trails, and an observation tower.

"What we want to do," DeVictor said, "is make this educational area an outdoor laboratory for schools and other groups."

**Michael A. Watkins,**  
district conservationist, SCS, Lawrence, KS

---

## Critical Area Reclaimed in South Carolina

A former sanitary landfill in Greenwood County, SC, has been reclaimed through the combined efforts of the county, the State, and the Resource Conservation and Development (RC&D) Program of the U.S. Department of Agriculture.

The former landfill covers 35 acres in an area of very steep slopes. Four years ago the site was bare and eroding. Some of the slopes at the edge of the landfill descended 60 feet, and erosion was depositing considerable sediment on adjacent property. Today, after reclamation, the slopes are stable, and the site supports a potential timber crop of loblolly pine.

As one of six counties in the Ninety-Six District RC&D Project, Greenwood was eligible for RC&D program cost-sharing for critical area treatment. The county provided a nearly equal value of work as their local share of the costs.

The local RC&D staff first consulted with State officials about health concerns at the former waste site. They then planned, designed, and helped apply a conservation system to protect the area. County employees and equipment were used to install the conservation practices on the ground.

The practices included two debris basins, three pipe-drop structures, a half-mile-long diversion, and a vegetated waterway with rock riprap baffles. The area was then smoothed and seeded to weeping lovegrass to provide close ground cover. Pine seedlings provided by the State Commission of Forestry were planted to provide climax vegetation.

**James C. Sanders, Jr.,**  
district conservationist, SCS, Florence, SC

---



Rock riprap baffles stretch across a graded waterway, shown here before seeding. This is one of the practices installed to control erosion at the site of a former sanitary landfill in Greenwood County, SC.



Moving?

Send present mailing label and  
new address including zip code to:

U.S. Department of Agriculture  
Soil Conservation Service  
P.O. Box 2890, Room 6117-S  
Washington, D.C. 20013-2890

Official Business  
Penalty for private use, \$300

NATIONAL AGRICULTURAL LIBRARY



1022771977

## AgEvents

1985

March	17-23 20	National Wildlife Week National Agriculture Day
April	21-27 22	Keep America Beautiful Week National Arbor Day
May	1-2 12-19	International Land, Pasture, and Range Judging Contest Soil Stewardship Week
June	5 11-15	World Environment Day National History Days
September	15-21 28	National Farm Safety Week National Hunting and Fishing Day
October	6-12 16	National 4-H Week World Food Day
November	22-28	National Farm City Week

## New Publications

### Soil Erosion: Quiet Crisis in the World Economy

by Lester R. Brown  
and Edward C. Wolf

Lester Brown, president of the Worldwatch Institute, says he helped write this report because he thinks erosion is a worldwide problem reaching epidemic proportions, but one that's not getting much attention from governments.

He hopes these governments act before a soil crisis—similar to but worse than the oil crisis of the seventies—forces action by causing a 50-percent increase in the prices of some foods. Brown says all it would take to precipitate such a crisis is the failure of

one crop in two of "the world's 'big four' food producers"—the United States, the Soviet Union, India, and China.

Brown and co-author Edward Wolf believe governments should begin treating soil more like oil, both because it is mined at about the same rate and because it can have an even greater effect on economies than oil.

Brown and Wolf say one reason governments are not as aware of the soil depletion as they are of the oil depletion is that estimates "are regularly made for oil reserves" but not for world soil reserves. They say world food supply projections made in the late sixties and early seventies fell short partly because they failed to account for a loss in productivity caused by a depletion of soil reserves.

To "help remedy this shortcoming" they provide an estimate of excessive cropland erosion globally—25.4 billion

tons a year. The authors say, "Our estimate of world topsoil loss from cropland is not highly refined and by no means final. Though inexact, it is presented here to draw attention to a process that will eventually undermine the world economy if not arrested. Without some sense of how fast soils are being lost, it will be difficult to mobilize the resources to save them."

Copies of *Soil Erosion* are available for \$4 each from the Worldwatch Institute, 1776 Massachusetts Avenue, N.W., Washington, DC 20036.

Donald L. Combs,  
contributing editor, *Soil and Water Conservation News*, SCS,  
Washington, DC

### Recent Soil Surveys Published

by the Soil Conservation Service

**Alabama:** Shelby County.  
**Arkansas:** Sharp County.  
**Iowa:** Monroe County.  
**Missouri:** Marion and Ralls Counties.  
**Montana:** McCone County.  
**Nebraska:** Kearney County.  
**Nevada:** Lyon County Area.  
**Ohio:** Fulton County.  
**South Dakota:** Gregory County.  
**Tennessee:** Carroll County.  
**West Virginia:** Mercer and Summers Counties.